repeatedly bends the flexible area fa of the flexible display **100**, the display medium **140** in the flexible area fa which is exerted by an external force would be blocked by the supporting structures **130** and would not be able to flow to the two non-flexible areas fn. Thus, the display medium **140** in the flexible area fa still remains in the flexible area fa, and the display medium **140** in the non-flexible areas fn still remains in the non-flexible areas fn, so that the flexible display **100** possesses stable display quality.

In the present embodiment of the invention, the flexible display **100** further includes a number of sub-supporting structures **150** disposed in the flexible area fa and used for abutting the first module **110** and the second module **120**. The supporting structures **130** and the sub-supporting structures **150** can be formed on the first module **110** or the second module **120** by way of printing, transferring, lithography or spraying. Moreover, the supporting structures **130** and the sub-supporting structures **150** can further be adhered to the first module **110** and the second module **120**, so that the structure of the flexible area fa is more stable and the display quality of the flexible display **100** can be more stably maintained. For example, after the first module **110**, the second module **120**, the supporting structures **130** and the sub-supporting structures **150** are assembled together, the assembly is baked, and is further radiated by a UV light, so that the supporting structures **130** and the sub-supporting structures **150** can be adhered to the first module **110** and the second module **120**. In the present embodiment of the invention, the height of each supporting structure **130** and that of each sub-supporting structure **150** are substantially equal to the gap between the first module **110** and the second module **120**. Thus, besides the supporting structures **130**, the sub-supporting structures **150** also provide supporting function in the flexible area fa.

In an exemplification of the present embodiment of the invention, the first module **110** includes a number of data lines **110***d* and a number of scan lines **110***s*. The data lines **110***d* and the scan lines **110***s* are interlaced with each other to form a number of pixel areas. The positions of two supporting structures **130** correspond to that of two of the data lines **110***d* and extend along two of the data lines **110***d*. Further, the position of each sub-supporting structures **150** is disposed correspondingly to that of any of the data lines **110***d* or any of the scan lines **110***s*. In an exemplification of the present embodiment of the invention, a supporting structure **130**, a number of sub-supporting structures **150** and another supporting structure **130** are sequentially disposed correspondingly to the positions of adjacent data lines **110***d*, and the supporting structures **130** and the sub-supporting structures **150** all extend along the Y-axis direction. Thus, none of the supporting structures **130** and the sub-supporting structures **150** is disposed in the pixel areas lest the supporting structures **130** and the sub-supporting structures **150** might affect the aperture ratio of the flexible display **100** when providing support. Alternatively, when the aperture ratio of the flexible display **100** is not a matter of concern, the supporting structures **130** and the sub-supporting structures **150** could be disposed in the pixel areas.

Alternatively, each sub-supporting structure **150** could be disposed without corresponding to the adjacent data line **110***d* as illustrated in FIG. **2**A-FIG. **2**C. Referring to FIG. **2**A-FIG. **2**C, top views of other flexible displays according to a first embodiment of the invention are respectively shown. In comparison to the sub-supporting structures **150** of FIG. **1**A, the sub-supporting structures **151** of FIG. **2**A extend along the X-axis direction and correspond to a number of scan lines **110***s*. As the sub-supporting structures **150** depicted in FIG. **1**A, a number of sub-supporting structures **152** of FIG. **2**B also extend along the Y-axis direction and correspond to a number of data lines **110***d*. Two ends of the adjacent sub-supporting structures **152** of FIG. **2**B are not aligned with each other for enhancing the effect of blocking the display medium around the edges of the flexible display. Thus, the possibility of free-flow display medium is greatly decreased. Similar to the sub-supporting structures **151** of FIG. **2**A, a number of sub-supporting structures **153** of FIG. **2**C also extend along the X-axis direction and correspond to a number of scan lines **110***s*. Two ends of the adjacent sub-supporting structures **153** of FIG. **2**C are not aligned with each other for enhancing the effect of blocking the display medium at the location near the supporting structures **130**. Thus, the possibility of free-flow display medium is greatly decreased.

As indicated in FIG. **1**A and FIG. **2**A-FIG. **2**C, the cross-section of the sub-supporting structure is a rectangle; however, could be other shapes such as a trapezoid or others. In the present embodiment, the sub-supporting structures disposed on the XY plane are depicted as the shape of strips, as indicated in FIG. **1**A and FIG. **2**A-FIG. **2**C. However, anyone who is skilled in the art would understand that the sub-supporting structures disposed on the XY plane can also be in the shape of grids or crosses, which are capable to provide the support function and block the movement of the display medium simultaneously.

Second Embodiment

Referring to FIG. **3**A, a cross-sectional view of a flexible display according to the second embodiment of the invention is shown. In comparison to the first embodiment, each sub-supporting structure **250** of the flexible display **200** of the present embodiment of the invention includes a first structure **251** and a second structure **252**.

In an exemplification of the present embodiment, the first structure **251** is disposed in the first module **110** and located between the first module **110** and the second module **120**; the second structure **252** is disposed in the second module **120** and located between the first module **110** and the second module **120**. The first structure **251** has a notch **251***r* in which the second structure **252** is embedded. To put it in greater details, the second structure **252** and the bottom surface **251***rs* of the notch **251***r* are separated by a gap. Referring to FIG. **3**B, a cross-sectional view of another flexible display according to the second embodiment of the invention is shown. The flexible display **200'** of FIG. **3**B is different from the flexible display **200** of FIG. **3**A in that the second structure **252'** of the sub-supporting structure **250'** of the flexible display **200'** of FIG. **3**B abuts the bottom surface **251***rs'* of the notch **251***r'* of the first structure **251'**.

According to the disposition indicated in either FIG. **3**A or FIG. **3**B, even when the flexible area fa is repeatedly bended by a user and makes the second structure **252** or **252'** become slightly bended, the second structure **252** is still embedded in the notch **251***r* and will not come off the notch **251***r* easily, and so is the second structure **252'** still embedded in the notch **251***r'* and will not come off the notch **251***r'* easily either. Thus, the display medium **140** is blocked by the sub-supporting structure **250** or **250'**, and the possibility of free-flow display medium is greatly decreased, so that the display quality of the flexible display **200** or **200'** can be maintained. Also, an adhesive layer (not illustrated) could be disposed between the first structure **251** or **251'** and the second structure **252** or **252'**, and the first structure and the second structure are adhered to each other to enhance the structural strength of the sub-supporting structure.